

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.







# CURRENT LITERATURE IN AGRICULTURAL ENGINEERING

BUREAU OF AGRICULTURAL CHEMISTRY AND ENGINEERING  
UNITED STATES DEPARTMENT OF AGRICULTURE

---

WASHINGTON, D.C.

---

Vol. 9, No. 4.

November, 1939.

## Accidents.

Design for safety. Architectural forum. v.70,no.5. May, 1939. p.333-336. Last year, for the first time, home accidents killed more people than automobiles, became the largest single cause of accidental death.

Safety in connection with farm machinery. California cultivator. v.86,no.17. August 26, 1939. p.472.

Safety on the farm is mostly home made. Address by S. H. McCrory before the 4th annual Northwest accident conference, St. Paul, Minn., April 11, 1939. Washington, D. C., U.S. Dept. of Agriculture, 1939. 12p. mimeographed.

## Agricultural Engineering.

Agricultural engineering co-operation in improving plant, animal and human nutrition. By S. P. Lyle. In Abstracts of papers and address. Proceedings of the 40th annual convention. Association of Southern agricultural workers. Held in New Orleans, La., Feb. 1-2-3, 1939. p.45-46.

Educational requirements in agricultural engineering. By Alexander Hay. Presented at a meeting of the Institution of British agricultural engineers at Windsor, 6th July, 1939. n.p. 4p. mimeographed.

## Agriculture.

Agricultural statistics 1939. U.S. Department of agriculture. Washington, U.S. Govt.print.off., 1939. 597p.

Crop husbandry in the 18th century: Hampshire and the Isle of Wight. By G. E. Fussell. Journal of the Ministry of agriculture. v.46,no.4. July, 1939. p.387-391.

Fifty-first annual report, Rhode Island state college. Agricultural experiment station. By B. E. Gilbert. Kingston, R. I., 1939. 64p. Rhode Island state college. Agricultural experiment station. Contribution no.540.

Forty-ninth annual report for the year ending June 30, 1938, Agricultural experiment station, University of Arizona. Tucson, Arizona, 1939. 84p.



Agriculture. (Cont'd).

Guide for courses in the history of American agriculture. By E. E. Edwards. Washington, D. C., 1939. 192p. mimeographed. U.S. Department of agriculture. Library. Bibliographical contributions no.35.

Meeting the challenge of agriculture: report of extension work in agriculture and home economics in 1936. Washington, U.S. Govt. print.off., 1939. 104p.

Planning for a permanent agriculture, including a summary of the programs administered by the Department of agriculture that influence the use of the land. Washington, U.S. Govt. print. off., 1939. 71p. U.S. Department of agriculture. Miscellaneous publication no.351.

Relationship between soil maintenance and profitable farming. By F. L. Morison and J. I. Falconer. Wooster, Ohio, 1939. 32p. Ohio agricultural experiment station. Bulletin no.604.

Serving New Hampshire farms and homes; annual report of Director of cooperative extension work in agriculture and home economics, state of New Hampshire for the year 1938. Durham, N.H., 1939. 32p. University of New Hampshire. Extension service. Bulletin no.56.

Types of farming in Michigan. By E. B. Hill. East Lansing, Mich., 1939. 99p. Michigan state college. Agricultural experiment station. Special bulletin no.206 rev.

Use of farm maps. By O. W. Howe. St. Paul, Minn., 1939. 1p. University of Minnesota. Agricultural extension division. Agricultural engineering news letter no.89.

Wisconsin farm progress: 1938 report of the Extension service of the College of agriculture, the University of Wisconsin. Madison, Wis., 1939. 43p. University of Wisconsin. College of agriculture. Extension circular no.293.

Air Conditioning.

Equipment for all-year air conditioning. II. By W. H. Severns and P. E. Mohn. Urbana, Ill., 1939. p.7-28. University of Illinois. Engineering experiment station. Circular no.37.

Psychrometric chart: its application and theory. By William Goodman. Heating, piping and air conditioning. v.11, no.8. August, 1939. p.485-487. In addition to elementary uses of psychrometric chart--such as showing relationships between dry bulb, wet bulb, and dew point temperatures, and relative humidity--it provides simple and enlightening means of analyzing many complex problems in comfort and process air conditioning, including drying....New



Air Conditioning. (Cont'd).

psychrometric charts covering low, middle and high temperature ranges, with saturation curves for various barometric pressures, are presented. General theory of psychrometric chart is discussed in detail, and methods of solving problems by use of charts are described....These new charts facilitate solution of most problems and lead to clearer understanding of fundamentals.

Psychrometric chart: its application and theory. By William Goodman. Heating, piping and air conditioning. v.11,no.9. September, 1939. p.549-551.

Refrigerating problems in comfort air conditioning. By R. E. Gould. Urbana, Ill., 1939. p.72-103. University of Illinois. Engineering experiment station. Circular no.37.

Regulation of air temperature and humidity. By C. L. Ringquist. Urbana, Ill., 1939. p.58-71. University of Illinois. Engineering experiment station. Circular no.37.

Regulations of the National board of fire underwriters for the installation of air conditioning, warm air heating, air cooling and ventilating systems, as recommended by the National fire protection association. New York, National board of fire underwriters, 1939. 27p. NBFU pamphlet no.90.

Southwest uses desert coolers. By H. E. Slawson. Refrigerating engineering. v.38,no.2. August, 1939. p.81-82. Inexpensive room coolers operate through evaporation of water.

Study of summer cooling in the research residence for the summer of 1938. By A. P. Kratz and others. Heating, piping and air conditioning. v.11,no.8. August, 1939. p.515-524.

Summer cooling requirements in Washington, D.C., and other metropolitan districts. By F. C. Houghten and others. Heating, piping and air conditioning. v.11,no.9. September, 1939. p.587-591.

Alcohol Fuel.

Alcool motor e motores a explosão. Rio de Janeiro, D.F., Instituto nacional de tecnologia, 1937. 356p. Alcohol fuel and combustion motors.

Industrial alcohol from agricultural products and waste products. Selected references 1934-1938. London, Science Museum, 1938. 8p. mimeographed. Science Museum. Science library bibliographical series no.409.

Making fuel from farm crops has many angles. Idaho farmer. v.57,no.19. September 14, 1939. p.11. Discusses manufacturing alcohol from farm surpluses.



Associations.

Farm equipment institute officers. Farm implement news. v.60,  
no.21. October 19, 1939. p.33.

Barns.

Barns in sheets. Successful farming. v.37,no.9. September,  
1939. p.13. Something new in fireproof, rot-proof, and  
vermin-proof roofing and siding material.

One-story dairy barn. By S. A. Witzel. Agricultural engineering.  
v.20,no.10. October, 1939. p.395-397.

Stabling cows loose. By Wilber J. Fraser. Hoard's dairyman.  
v.83,no.8. April 25, 1939. p.249,265.

Brooders, Electric.

Electric heat saves little pigs: plans should be made now for electric  
brooder. By C. P. Wagner. Markets: building section.  
October 12, 1939. p.5.

Building Construction.

Better brickwork. By John W. Lewis. Indian engineering.  
v.106,no.2. August, 1939. p.71-72. Reinforcing for  
strength.

Handy tables for estimating brick. Brick and clay record.  
v.95,no.4. October, 1939. p.41.

Holding power of nailed joints. By J. C. Wooley. Agricultural  
engineering. v.20,no.10. October, 1939. p.385-386.

How to estimate accurately. By J. Douglas Wilson. American  
builder. v.61,no.10. October, 1939. p.72-73,128,130.  
Walls, cornice and roofing are discussed.

Land, materials, and labor costs. Technical monograph on housing  
prepared for the Industrial committee of the National resources  
committee. Washington, U.S. Govt.print.off., 1939. 101p.  
Housing monograph series no.3.

Looped wire for concrete reinforcement. By A. R. Legault. Fort  
Collins, Colo.. 1939. 22p. Colorado state college.  
Colorado experiment station. Bulletin no.452.

Mechanical structural analysis by the moment indicator: discussion.  
By Otto Gottschalk. American society of civil engineers.  
Proceedings. v.65,no.6. June, 1939. p.1037-1040.

Progress of earthquake-resistant design. By Henry D. Dewell. Civil  
engineering. v.9,no.10. October, 1939. p.601-604.  
In recent years there has been much advance in that phase of



Building Construction. (Cont'd).

structural design that has to do with making buildings earthquake resistant. Theory and research have been translated rapidly into practice, and result has been to greatly increase safety of structures in regions where quakes occur. Traces step by step sixty-year development of modern concepts of seismic design, concluding with summary of present knowledge.

Seismic method of exploration applied to construction projects. By E. R. Shepard. Military engineer. v.31,no.179. September-October, 1939. p.370-377. Purpose of paper is to outline, as accurately as possible, field of usefulness of seismograph as applied to shallow exploration problems and to discuss some of more important factors involved in such studies.

Who builds what in the building business? American builder. v.61,no.10. October, 1939. p.74,120,122. Survey shows large volume, variety, and value of buildings erected by typical American builder readers.

Building Materials.

Rammed earth construction. By Rockwell King DuMoulin. Consumers' digest. v.6,no.3. September, 1939. p.41-46.

Research in low-cost housing yields a solution in plywood. Architectural record. v.86,no.3. September, 1939. p.41-45.

Chemicals.

Selected information on manufacturers of chemicals and fertilizers having assets over \$10,000,000 each. From data collected on Works progress administration projects. Sponsored by the Securities and exchange commission. New York, John S. Swift co., inc., 1939. 66p. processed.

Chemistry, Technical.

Chemists make a new world. By Frederick Simpich. National geographic magazine. v.76,no.5. November, 1939. p.601-632. Creating hitherto unknown raw materials science now disrupts old trade routes and revamps the world map of industry.

Engineer and the chemist in agriculture. By Henry G. Knight. Agricultural engineering. v.20,no.8. August, 1939. p.299-302.

Coke.

Coke and byproducts. By H. L. Bennit. Washington, U.S. Govt.print. off., 1939. 910p. U.S. Bureau of mines. Chapter from Minerals yearbook 1939. Review of 1938 with final statistics for 1937.



Condensation.

Condensation problems in modern buildings. By L. V. Teesdale.  
Urbana, Ill., 1939. p.104-117. University of Illinois.  
Engineering experiment station. Circular no.37.

Containers.

Regulations of the National board of fire underwriters for the design, installation and construction of containers and pertinent equipment for the storage and handling of liquefied petroleum gases, including liquefied petroleum gas as a motor fuel as recommended by the National fire protection association. New York, National board of fire underwriters, 1939. 40p. NBFU pamphlet no.58.

Corrosion.

Corrosion in steam heating systems. By Leo F. Collins and Everette L. Henderson. Heating, piping and air conditioning. v.11,no.9. September, 1939. p.539-542. Its occurrence, causes and mitigation.

Cotton Gins and Ginning.

Effects of variations in design of gin-saw teeth on lint quality and ginning efficiency. By W. J. Martin and V. L. Stedronsky. Washington, U.S. Department of agriculture, 1939. 25p.  
"Literature cited": p.24-25. Processed.

Laboratory releases valuable information. By William J. Martin and Victor L. Stedronsky. Cotton ginner's journal. v.11,no.2. November, 1939. p.5,15. Effects of variations in design of gin-saw teeth on lint quality and ginning efficiency.

Lint quality and ginning efficiency are affected by design of gin-saw teeth. Cotton and cotton oil press. v.40,no.26. October 28, 1939. p.5,11. Tests revealed that ginning capacity with existing designs of gins can be improved by making reasonable increases in number of roached teeth on saws, by moderately increasing pitch of teeth tooth, or by changing roach-backed shape of teeth to straight-back design.

Culverts.

Native timber used for treated-wood culverts. By H. M. Armstrong. Canadian engineer. v.76,no.5. January 31, 1939. p.74,76,82.

Dams.

Construction of Shand Dam. Canadian engineer. v.77,no.10. September 5, 1939. p.4-9. Placing of concrete now started on \$1,300,000 construction project for Grand River conservation. Over twelve billion gallons of water to be held in storage. To be completed in November, 1940.



Dams. (Cont'd).

Construction progress at Shasta Dam. Engineering news-record.  
v.123,no.19. November 9, 1939. p.612-615. Prepara-  
tions are being made for peak activity next year at Shasta Dam on  
the Central valley project in California. Most of the foundation  
at the dam site has been uncovered, concreting equipment and a  
novel radial-cableway delivery system are being assembled and a  
proposed 9-mile conveyor belt system for delivering aggregate is  
being located. Concrete pouring is to start early in 1940. Work  
is well under way on the 30 miles of new railroad to replace the  
line that will be flooded by reservoir.

Deer Creek Dam, Provo River Project, Utah. By C. H. Carter.  
Reclamation era. v.29,no.8. August, 1939. p.210-213.

Small earthfill dam typical of modern practice. Engineering news-  
record. v.123,no.17. October 26, 1939. p.533.

Drainage.

Drainage methods. By D. H. Harker. Lafayette, Ind., 1939. 24p.  
Purdue university. Co-operative extension work in agriculture and  
home economics. Extension bulletin no.220.

Drainage on the farm. By W. W. Weir. Berkeley, Calif., 1939.  
30p. University of California. Agricultural experiment station.  
Circular no.304, rev.

Electric Wiring.

Observations on farm wiring. By John M. Larson. Agricultural  
engineering. v.20,no.10. October, 1939. p.388.

Outdoor wiring. By W. C. Harrington. Amherst, Mass., 1938.  
4p. mimeographed. Massachusetts state college. Agricultural  
extension service. Engineering extension series no.69, rev.

Wiring the dairy building. By W. C. Harrington. Amherst, Mass.,  
1939. 6p. mimeographed. Massachusetts state college. Agri-  
cultural extension service. Engineering extension series no.72.

Wiring the dairy barn. By W. C. Harrington. Amherst, Mass.,  
1938. 7p. mimeographed. Massachusetts state college. Agri-  
cultural extension service. Engineering extension series no.10.

Wiring the laying house. By W. C. Harrington. Amherst, Mass.,  
1938. 8p. mimeographed. Massachusetts state college. Agri-  
cultural extension service. Engineering extension series no.67.

Wiring the milk house. By W. C. Harrington. Amherst, Mass., 1938.  
4p. mimeographed. Massachusetts state college. Agricultural  
extension service. Engineering extension series no.13, rev.



Electricity in the Home.

Suggestions for users of electric ranges. By W. C. Harrington.  
Amherst, Mass., 1939. 1p. mimeographed. Massachusetts  
state college. Agricultural extension service. Engineering  
extension series no.31.

Electricity on the Farm.

All-electric farm. Popular mechanics magazine. v.72,no.3.  
September, 1939. p.334-335.

Electricity in agriculture. By H. J. Hopfen. International insti-  
tute of agriculture. Monthly bulletin of agricultural science and  
practice. v.30,no.8. August, 1939. p.305 T-315 T.  
"Publications consulted": p.315 T-318 T.

Electricity in the production of quality milk. An address by H. L. Garver  
given on Rural electrification day, Annual farm and home week program,  
University of Georgia, Athens, Ga., August 8, 1939. Washington,  
U.S. Bureau of agricultural chemistry and engineering, 1939.  
11p. mimeographed.

Farm electrification. By A. G. H. Dent. Electrical review.  
v.125,no.3225. September 15, 1939. p.353-354.  
Recent trends in research and development.

One-third of Indiana's farms electrified. By George Weymouth.  
Farmers guide. v.95,no.19. October 7, 1939. p.3,10.

Results of surveys on research in the uses of electricity in the  
dairy and poultry industries. By H. L. Garver given before Rural  
electrification division, A.S.A.E. St. Paul, Minn., June 22, 1939.  
Washington, U.S. Bureau of agricultural chemistry and engineering,  
1939. 15p. mimeographed.

Engineering.

Vicissitudes of an engineering formula. By Sherman M. Woodward.  
Civil engineering. v.9,no.10. October, 1939. p.615-616.

Erosion Control.

Characteristics of some meadow strip vegetations. By H. L. Cook and  
F. B. Campbell. Agricultural engineering. v.20,no.9.  
September, 1939. p.345-348. Tests reported were made at  
Spartanburg laboratory in fall and winter of 1937 to determine (1)  
effectiveness of three common forage crops in preventing scour in  
meadow strip and other channels and (2) water-carrying capacities  
of channels lined with these vegetations.

Present trend in the control of erosion in terrace outlets. By  
H. M. Wallace, Jr. Agricultural engineering. v.20,no.10.  
October, 1939. p.393-394.



Erosion Control. (Cont'd).

Prevention and control of gullies. By H. G. Jepson. Washington, U.S. Govt.print.off., 1939. 60p. U.S. Department of agriculture. Farmers' bulletin no.1813.

Soil conservation survey handbook. By E. A. Norton. Washington, U.S. Govt.print.off., 1939. 40p. U.S. Department of agriculture. Miscellaneous publication no.352.

Soil erosion control. By H. B. Roe and J. H. Neal. St. Paul, Minn., 1939. 36p. University of Minnesota. Agricultural extension division. Bulletin no.201.

Fans.

Characteristics of duct systems and fans. By S. H. Downs. Urbana, Ill., 1939. p.29-36. University of Illinois. Engineering experiment station. Circular no.37.

Farm Buildings.

Farm buildings in relation to farm management in Indiana. By Lynn Robertson. Lafayette, Ind., 1939. 48p. Purdue university. Agricultural experiment station. Bulletin no.435.

Farm Machinery and Equipment.

Changes in farm power and equipment: Field implements. By E. G. McKibben and others. Philadelphia, Penna., 1939. 111p. Processed. U.S. Work projects administration, National research project. Report no.A-11.

Combining under Wisconsin conditions. By F. W. Duffee. Farm implement news. v.60,no.17. August 24, 1939. p.31,34.

Cost of using farm machinery in Indiana. By E. L. Butz and O. G. Lloyd. Lafayette, Ind., 1939. 17p. Purdue university. Agricultural experiment station. Bulletin no.437.

The "Cultipacker" grass seeder. By F. W. Duffee. Farm implement news. v.60,no.20. October 5, 1939. p.48-49.

Engineering aspects of equipment needs for small farms. By Frank J. Zink. Agricultural engineering. v.20,no.10. October, 1939. p.379-382. Recommends that agricultural engineers of various state colleges conduct research on basic principles leading to most desirable economics obtainable in farm machinery usage. New table of values, in light of present knowledge, may be constructed. Men within state boundaries should, in doing this, remember that few needs of few farmers in their states are not going to be foundation for business, nor likewise for an industry. It is time to analyze existing products in view of mass majority of needs, and to design machinery and tractors which will



Farm Machinery and Equipment. (Cont'd).

lower costs of production. In tractor industry today we are "stringhalted" and "bog spavined" because tractor does not, except in minority of cases, finish all jobs to be done on farm. Farm implement industry may build itself greater if that well-known motto is used. "It is not good business unless seller and buyer both benefit."

Garden cultivator uses electricity to fertilize soil. Popular science. v.135,no.4. October, 1939. p.63.  
Current increases nitrogen content and stimulates bacteria growth in soil and thus improves its fertility. Generator with output of 110 volts A.C., storage battery for exciting armature field, and transformer that steps up current to 15,000 volts, are mounted on walking-type garden tractor equipped with small gasoline motor that drives both tractor and electric generator. Current is conducted through pair of electrodes to furrows in soil made by cultivator.

Implements at the Royal show. By S. J. Wright. Journal of the Ministry of Agriculture. v.46,no.5. August, 1939. p.463-467.

Machinery soon to replace "Stoop" labor in sugar-beet fields. By F. Hal Higgins. Farm implement news. v.60,no.21. October 19, 1939. p.38-41.

Mechanical preparation of sugar beet seedbeds. Implement and machinery review. v.65,no.769. May 1, 1939. p.82-84.

Mechanization of sugar-beet production. By E. M. Mervine and S. W. McBirney. Agricultural engineering. v.20,no.10. October, 1939. p.389-392,394.

Percent of wheat, oats and corn harvested by different methods in 1938. Farm implement news. v.60,no.17. August 24, 1939. p.24.

Take good care of machinery. By A. H. Hollenberg. Better farm equipment and methods. v.12,no.1-2. September-October, 1939. p.12.

Water-going mowing machine cuts weeds in lagoon. Popular mechanics magazine. v.72,no.3. September, 1939. p.369.  
Driven by a light automobile engine, an all-steel scow is equipped with powered cutting blades at front. Controllable wings at stern serve as rudders and shield propeller.

Why not left-handed disk jointers? By E. V. Collins and C. K. Shedd. Agricultural engineering. v.20,no.10. October, 1939. p.387-388.  
Observations were made during limited trials:  
1. Landside pressure was reduced. 2. Quality of finished plowing appeared to be equal to that obtained with other jointer equipment.  
3. Backfurrow ridge was less pronounced. 4. Width and depth of cut



Farm Machinery and Equipment. (Cont'd).

were more uniform. Theoretical or probable advantages in addition to reduction in draft are: 1. In plowing under cornstalks with multiple-bottom plows, it has been observed that there is tendency to work trash to right, so that it gets between plow beam and coulter and rides out on top of furrow edge or starts to clog plow. 2. Since it is obvious that shorter landside may be used with this equipment, it should be possible to make plow which will work better on curves and over uneven ground. 3. It also appears that reduction in landside pressure and shorter landside required would be of special advantage in connection with tractor-mounted plows.

Farm Shop.

Farm shop and tool equipment. By A. C. Kennedy. Columbus, Ohio, 1939. 23p. Ohio state university. Agricultural extension service. Bulletin no.201.

Farm Structures.

Feed-lot and ranch equipment for beef cattle. By W. H. Black. Washington, U.S. Govt.print.off., 1939. 18p. U.S. Department of agriculture. Farmers' bulletin no.1584, rev.

Fertilizer Placement.

Fertilizing the subsoil. Farm implement news. v.60,no.22. November 2, 1939. p.33.

Fertilizers.

Analyses of commercial fertilizers. By H. E. Curtis and others. Lexington, Ky., 1939. 67p. University of Kentucky. Regulatory series. Bulletin no.18.

Commercial fertilizers. By H. R. Kraybill and others. Lafayette, Ind., 1939. 80p. Purdue university. Agricultural experiment station. Circular no.250.

Commercial fertilizers in 1938-39 and their uses. By G. S. Fraps and others. College Station, Texas, 1939. 59p. Agricultural and mechanical college of Texas. Agricultural experiment station. Bulletin no.577.

Electric fertilizer boosts supply of nitrates. Popular mechanics. v.72,no.4. October, 1939. p.572. Laboratory tests with water having slight trace of nitrate resulted in increase of 800 per cent. Machine consists of storage battery, electric generator and transformer mounted on small garden tractor. Generator produces an alternating current of 110 volts which is stepped up to 15,000 volts by transformer and conducted into soil through pair of metal-core insulators, where it is passed between two electrodes. Cultivator blades cut parallel furrows for electrodes.







Floods and Flood Control. (Cont'd).

Possible and probable future floods. By W. P. Creager. Civil engineering. v.9,no.11. November, 1939. p.668-670. Analysis of data on "Record Floods" suggests need for comprehensive program of research in storm probabilities.

River rebuilt to curb floods. By Andrew R. Boone. Scientific American. v.161,no.5. November, 1939. p.264-265. Engineers are protecting Los Angeles and surrounding area. Flood control and water conservation dual aim.

Flow Meters.

Deep-well current meter. In Forty-ninth report for the year ending June 30, 1938, Agricultural experiment station. University of Arizona. Tucson, Ariz., 1939. p.21-23.

Fluid flow measurement by head type metering elements. By F. C. Stewart and J. S. Doolittle. Instruments. v.12,no.7. July, 1939. p.175-184. Venturi tubes, orifices, nozzles and pitot tubes.

Fluid meters: their theory and application. New York, N.Y., American society of mechanical engineers, 1931-37. Pt.1, 4th ed., 1937; Pt.2, 1931; Pt.3, 1933.

Flow of Water and Gases.

Determining discharge at gaging stations affected by variable slope. By M. C. Boyer. Civil engineering. v.9,no.9. September, 1939. p.556-558. Ideally, stream gaging stations should be located at points where stage-discharge relation is unaffected by changes in conditions downstream--that is, at points above influence of backwater. As practical matter, such locations are becoming increasingly difficult to find. Satisfactory results can still be obtained, however, by making use of simultaneous readings from two stations. Paper outlines methods used by Geological Survey in such cases.

Flow of water in channels under steep gradients. By W. F. Durand. Engineering. v.148,no.3837. July 28, 1939. p.120-122.

Flow of water in the main diversion floodway of the Little River drainage district in southeast Missouri. By C. E. Ramser. Washington, U.S. Soil conservation service, 1939. 10p. mimeographed.

Kutter's n in Trinity River floodway: field study at Dallas, Texas, supplies useful data on overbank flow. By F. A. McCaughan. Civil engineering. v.9,no.10. October, 1939. p.605-608. Both technique and results of study of overbank flow in artificial channel of Trinity River at Dallas, Texas, are reported. With flow of 77,000 cu ft per sec, values of Kutter's "n" were determined in



Flow of Water and Gases. (Cont'd).

each of five reaches of floodway, which is 2,000 to 3,000 ft in width and more than seven miles long. Also observed was loss of head that occurred through each of nine bridges crossing the main floodway channel.

Laboratory investigation of flume traction and transportation: discussion. By Y. L. Chang. American society of civil engineers. Proceedings. v.65,no.6. June, 1939. p.1001-1006.

Foods, Frozen.

Frozen fruits and vegetables for home use. By J. D. Winter and I. Noble. St. Paul, Minn., 1939. 8p. University of Minnesota. Agricultural extension division. Bulletin no.200.

Frost Protection.

Frost prevention in orchards and vineyards. By J. B. Harris. Adelaide, South Australia, Frank Trigg, 1937. 11p. Department of agriculture of South Australia. Bulletin no.329. (Reprinted from the "Journal of agriculture", September, 1937).

Orchardist controls the weather: heaters cut frost damage on Hogue Tract. Idaho farmer. v.57,no.19. September 14, 1939. p.17.

Grain - Cost of Handling.

Cost of handling grain. Grain and feed journals. v.82,no.8. April 26, 1939. p.329. Cost of handling grain alone should be four cents a bushel; storage for ten days should be not less than one cent and when it comes to guaranteeing weights on rail shipments, guaranteeing of railroad's service is worth at least one cent a bushel more.

Cost of handling grain. By Lucian A. Garner. Grain and feed journals consolidated. v.82,no.12. June 28, 1939. p.533.

Grain - Moisture Content.

Effect of relative humidity on viability, moisture content, and respiration of wheat, oats, and barley seed in storage. By D. W. Robertson and others. Journal of agricultural research. v.59,no.4. August 15, 1939. p.281-291.

Heating.

Effect of size and type of air inlet and outlet on the heat output of convectors. By A. P. Kratz and others. Heating, piping, and air conditioning. v.11,no.9. September, 1939. p.573-581.

Fuel consumption estimating formulas given in housing authority bulletin. Heating, piping and air conditioning. v.11,no.9. September,



Heating. (Cont'd).

Heating low-cost homes. By Robert K. Thulman and L. E. Seeley.  
Heating, piping and air conditioning. v.11,no.8.  
August, 1939. p.511-514.

Physical research in connection with radiant heating methods. 1933-39.  
London, Science Museum, 1939. 1p.mimeographed. Science museum.  
Science library bibliographical series no.485.

Physiology and comfort in connection with radiant heating methods.  
1933-39. London, Science museum, 1939. 3p. mimeographed.  
Science museum. Science library bibliographical series no.486.

Thermal interchanges between the body and its atmospheric environment.  
By C. Sheard. Urbana, Ill., 1939. p.138-151. Biblio-  
graphy: p.150-151. University of Illinois. Engineering experi-  
ment station. Circular no.37.

Houses.

Hurricane house turns with wind. By Carl Warden. Popular science.  
v.135,no.4. October, 1939. p.68-69. Weather-vane  
dwelling designed for both safety and comfort.

Low cost homes. By H. E. Wichers. Manhattan, Kans., 1939.  
50p. Kansas state college of agriculture and applied science.  
Engineering experiment station. Bulletin no.38.

Hydraulics.

Fundamentals of river and canal hydraulics. By Radha Krishna Khanna.  
Indian engineering. v.106,no.2. August, 1939. p.59-62.

Relation of the statistical theory of turbulence to hydraulics. By  
A. A. Kalinske. American society of civil engineers. Proceedings.  
v.65,no.8,pt.1. October, 1939. p.1387-1406. Basic  
principles of statistical theory of fluid turbulence are outlined.  
Only those ideas and conceptions of importance in hydraulics  
problems are presented; more complicated mathematical details are  
omitted. Turbulence can be characterized by intensity parameters  
which are root mean square values of fluctuating velocity components,  
and length parameter proportional to most probable eddy size.  
Specific parameters used in characterizing energy dissipation and  
diffusion power of turbulence are derived, and experimental tech-  
niques and data are presented to illustrate how these parameters  
are obtained. Two major problems in hydraulics in which knowledge  
of turbulence mechanism is of importance are those involving in-  
crease or decrease of energy dissipation, and transportation of  
sedimentary materials. Practical application of theories of tur-  
bulence to some specific problems is indicated. Experimental data  
were obtained by injecting color streams and suspended immiscible  
liquid droplets into turbulent water streams and by using motion-  
picture photography.



### Hydrology.

Hydrology of the Great Lakes. A symposium: discussion. By S. T. Harding and others. American society of civil engineers. Proceedings. v.65,no.8,pt.1. October, 1939. p.1435-1444.

Typical quantitative analysis as applied to Lake Superior. By C. R. Pettis. American society of civil engineers. Proceedings. v.65,no.4. April, 1939. p.584-595. Method of making quantitative analysis of hydrology of Great Lakes, as illustrated by detailed study of hydrology of Lake Superior, is presented. Certain deductions are made, based on evidence from available data. By means of these deductions, values are obtained for evaporation from lake surface. Knowing evaporation, underground flow to lake and land losses can be computed. Validity of method has been checked by evaporation experiments. Conclusion reached is that evaporation and underground flow are greater, and land losses are less, than values that have been generally accepted.

### Insulation.

Building insulation: types and applications. By S. Konzo. Urbana, Illinois, 1939. p.79-103. Bibliography: p.95-96. University of Illinois. Engineering experiment station. Circular no.37.

Insulated for operators' comfort. By A. L. Sargent. Power. v.83,no.9. September, 1939. p.60-61.

Supplemental irrigation in Missouri. By R. P. Beasley. Columbia, Mo., 1939. 15p. University of Missouri. Agricultural experiment station. Bulletin no.410.

### Irrigation.

Annual report (technical) of the Central board of irrigation, India, 1937-38. Simla, India, 1939. 156p. Central board of irrigation. Publication no.19.

Irrigation of small fruits. London, Science museum, 1939. 3p. mimeographed. Science museum. Science library bibliographical series no.476.

Lift irrigation. By Alfred Chatterton. Indian engineering. v.106,no.2. August, 1939. p.51-53.

Rain making on thirsty ground. By Paul Work. American agriculturist. v.136,no.14. July 8, 1939. p.6,14.

Rain making on thirsty ground. By Paul Work. American agriculturist. v.136,no.15. July 22, 1939. p.6. Part II.

Report on irrigation districts in California for the year 1937. Sacramento, Cal., State print.off., 1939. 61p. Processed. State of California. Department of public works. Division of water resources. Bulletin no.21-I.



Irrigation. (Cont'd).

Something new in rain machines. By W. R. Postin. Implement record. v.35,no.11. November, 1938. p.22. Machine is built upon old Model 63 International truck, which has been equipped with 9.75 x 20 dual pneumatic tires. Mounted back of cab is Caterpillar 50 Diesel power unit which drives five inch pump with V belts. Tower and booms are constructed of iron pipe, welded; and are trussed and guyed with wire cable. One hundred feet of pipe, suspended from booms, extends from each side of pump connection, leading off with five inch from pump and reduced to four inch at about 40 feet from pump. Each 100 feet of pipe has about 42 openings, to which are attached lengths of one inch hose reaching to ground. Puts about one inch of water on 200 foot strip at rate of two acres per hour, and has covered about 1500 acres this summer at cost of approximately one dollar per acre. Advantages claimed for this machine are, less man power required and lower cost of operation, more acreage covered per hour, and no trouble from wind as on spray machine.

Twenty-second biennial report of the Department of roads and irrigation. 1937-38. Lincoln, Neb., 1938. 992p.

Land Grant Colleges.

Land-grant colleges. By G. A. Works and Barton Morgan. Prepared for the Advisory committee on education. Washington, U.S. Govt. print.off., 1939. 141p. Staff study number 10.

Study of the work of the land grant colleges in the Tennessee valley area in cooperation with the Tennessee valley authority. By C. R. Ball. n.p. 1939. 76p.

Land Utilization.

Economic study of land utilization in Chautauqua county, New York. By Alexander Joss. Ithaca, N.Y., 1939. 51p. Cornell university. Agricultural experiment station. Bulletin no.720.

Making plans grow like plants. Consumers' guide. v.6,no.7. September, 1939. p.3-6. Land-use planning finds new roots in farmer-expert-administrator committees organizing in counties and states.

Settler relocation: a description of the Minnesota plan. By A. D. Wilson. Journal of land and public utility economics. v.14,no.4. November, 1938. p.402-416. About 100,000 acres of sub-marginal land in two conservation areas have been purchased and over 200 farm families have been relocated on better land, with better access to roads, schools, and markets. Plans followed in relocating settlers have been considered by many to be very conservative. Aim has been (1) to appraise all submarginal land bought on basis fair to seller and fair to taxpayers furnishing purchase money; and (2) to aid in relocating all eligible clients without subsidy, but with farm set-up that offers to each fair chance to pay out under average conditions, if he will make reasonable effort to do so.



Milk, Irradiated.

Irradiation of milk. By K. G. Weckel and H. C. Jackson. Madison, Wis., 1939. 55p. References: p.53-55. University of Wisconsin. Agricultural experiment station. Research bulletin no.136.

Miscellaneous.

Foreign commerce yearbook 1938. U.S. Bureau of foreign and domestic commerce. Washington, U.S. Govt.print.off., 1939. 435p.

How to start a training program. Washington, D. C., U.S. Department of agriculture. Office of personnel. 1939. 33p. Processed.

Seventh world's poultry congress and exposition, Cleveland, Ohio, July 28 to August 7, 1939. Baltimore, Md., Waverly press, inc., 1939. 551p.

Structure of the American economy. Part I. Basic characteristics. Report prepared by the Industrial section [National resources committee] under the direction of G. C. Means. Washington, U.S. Govt.print.off., 1939. 396p.

United States Government printing office style manual. Rev. ed. January, 1939. Washington, U.S. Govt.print.off., 1939. 346p.

Orchard Heaters.

New type orchard heater tested. Implement record. v.36,no.11. November, 1939. p.19. New heaters are oil burners equipped with special combustion chamber on their stacks. By means of this chamber approximately 30 per cent of gas resulting from combustion of oil fumes is returned to burner. Most of the oxygen has been burned out of this gas which is inert. Mingling with oil fumes rising to combustion chamber this gas forces apart carbon molecules in fumes. It is hoped that this will make possible more complete and cleaner burning of oil. Orchard heating experiments are being carried on by College of Agriculture in co-operation with grower's committee of California fruit grower's exchange and citizens' committee of Los Angeles Chamber of commerce.

Pest Control.

Control of termites in buildings. By Neely Turner and J. F. Townsend. New Haven, Conn., 1939. 14p. Connecticut agricultural experiment station. Circular no.134.

Electrocuting light traps and suction light traps for catching insects. London, Science museum, 1939. 2p. mimeographed. Science museum. Science library bibliographical series no.487.

Fortune on a limb. Popular mechanics magazine. v.72,no.3. September, 1939. p.337-344. Discussion of pest control.



Plastics.

New jobs for plastics. By Joseph L. Nicholson. Forbes.  
v.44,no.4. August 15, 1939. p.10-12. Plastics for  
specialized uses; plastics at radically lower cost; plastics in  
larger units. In these three trends, now developing, lie the seeds  
of far-reaching changes for every industry.

Poultry Houses and Equipment.

Rearing turkeys in semi-confinement in South Dakota. By M. H. Simonson  
and W. E. Poley. Brookings, S. Dak., 1939. 19p. mimeographed.  
South Dakota State college. Extension circular no.210.

Production Costs.

Cost of farm power. By Paul Williamson. Hoard's dairyman.  
v.84,no.15. August 10, 1939. p.434. Table 1. Cost  
of keeping a horse for one year, 230 horses on 71 farms, 1937.  
Table 2. Cost of keeping a tractor for one year, 80 tractors  
on 64 farms, 1937.

Pumps and Pumping.

Centrifugal pump characteristic curves. By K. B. Humphrey. Power  
plant engineering. v.43,no.9. September, 1939. p.570-571.  
By use of characteristic curves, centrifugal pumps may be adapted  
to changed conditions without great reduction in efficiency.

Regulations of the National board of fire underwriters for the in-  
stallation and operation of centrifugal fire pumps as recommended  
by the National fire protection association. New York, National  
board of fire underwriters, 1939. 52p. NBFU pamphlet no.20.

Quick Freeze.

Immersion quick freezing. By John P. Ferris and R. Brooks Taylor.  
Ice and refrigeration. v.97,no.3. September, 1939.  
p.177-180. Immersion process of quick freezing foods  
described in paper is result of coordinated research and investi-  
gations embracing agriculture, market economics, and engineering.  
Both laboratory experiments and demonstrations on pilot-plant  
scale were included. Appropriate phases of research and demonstra-  
tion work were carried out by each of five public agencies: engin-  
eering experiment station, agricultural experiment station, and  
agricultural extension service of University of Tennessee; agri-  
cultural experiment station of University System of Georgia; and  
agricultural industries department of Tennessee Valley Authority.

Reclamation.

Sand-dune reclamation in the southern Great Plains. By C. J. Whitfield.  
Washington, U.S. Govt.print.off., 1939. 13p. U.S. Department  
of agriculture. Farmers' bulletin no.1825.



### Refrigeration.

Effect of storage temperatures on peaches. By M. H. Haller and P. L. Harding. Washington, U.S. Govt. print. off., 1939. 32p.  
"Literature cited": p.31-32. U.S. Department of agriculture.  
Technical bulletin no.680.

Refrigeration of apples and pears. Refrigerating engineering:  
R. E. application data. Sec.4. v.38,no.2. August, 1939.  
p.1-8.

### Refrigerator Lockers.

Refrigerated locker service for rural patrons. By S. T. Warrington.  
St. Paul, Minn., 1939. 16p. University of Minnesota. Agri-  
cultural extension division. Bulletin no.202.

### Regulators.

Siphons as water-level regulators: discussion. By T. J. Corwin.  
American society of civil engineers. Proceedings. v.65,no.4.  
April, 1939. p.693-694.

Siphons as water-level regulators: discussion. By Henry R. King.  
American society of civil engineers. Proceedings. v.65,no.6.  
June, 1939. p.1041-1044.

### Research.

Agricultural research in New Hampshire. Annual report of the Director  
of New Hampshire agricultural experiment station for the year 1938.  
Durham, N. H., 1939. 34p. University of New Hampshire.  
Agricultural experiment station. Bulletin no.313.

Committee on grounding hears report on research. By Howard S. Warren.  
Heating, piping and air conditioning. v.11,no.9. September,  
1939. p.557-558. Present report tells of work done since  
previous meeting of committee about year ago.

Cooperative research sponsored by society at various institutions.  
Heating, piping and air conditioning. v.11,no.9. September,  
1939. p.592-595. University of California; Case School of  
Applied Science; University of Illinois; Lehigh university;  
Michigan College of Mining and Technology; University of Minnesota;  
University of Pennsylvania; University of Pittsburgh, Agricultural  
and Mechanical College of Texas; University of Wisconsin.

Importance of research in the national farm program. Remarks of  
H. A. Wallace, Secretary of Agriculture, at the cornerstone  
ceremony of the Northern Regional Research Laboratory at Peoria,  
Ill. Washington, U.S. Department of Agriculture, 1939.  
4p. mimeographed.



## Reservoirs.

Elevation control for improvements in floodwater check reservoirs.

By C. S. Bennett. Engineering news-record. v.123,no.19.  
November 9, 1939. p.622. In order to prevent undue damage to structures during high-water periods in the five flood-water check reservoirs of the Miami Conservancy District, the engineers have decreed that no building can take place below a contour five feet below the crest of spillways. They have placed in the area a system of benchmarks which make it unnecessary to run more than a half mile of levels to obtain the flood-water elevation at a proposed building site.

Functional design of flood control reservoirs. By C. J. Posey and Fu-Te I. American society of civil engineers. Proceedings. v.65,no.8,pt.1. October, 1939. p.1317-1326.

Functional design of flood control reservoir has as its objective determination of relation between storage space that must be provided and corresponding reduction of flood peak. Method of incorporating this relation into study of economic balance of flood control system has been explained in detail. Mr. Woodward's "five-sixths rule," which heretofore has provided only direct method for functional design computations, is limited in its application to reservoirs of such proportions that maximum outflow is small compared with average inflow during flood, and to reservoirs with orifice-type outlets and certain type of depth-capacity relationship. In this paper writers have generalized Mr. Woodward's method and have extended it to apply to reservoirs with either orifice- or weir-type outlets, in valleys of wide range of morphological configuration. Although relationships derived can be used in design of multiple-purpose reservoirs, present discussion is restricted to reservoirs for flood control only.

## Runoff.

Analysis of run-off characteristics: discussion. By Otto H. Moyer. American society of civil engineers. Proceedings. v.65,no.8, pt.1. October, 1939. p.1423-1426.

## Silos.

New type wood silo. By Mandus E. Bridston. Capper's farmer. v.50,no.7. July, 1939. p.11,19.

## Silt.

Selected annotated bibliography on sedimentation as related to soil conservation and flood control. Comp. by C. B. Brown and F. F. Barnes. Washington, D.C.- U.S. Soil conservation service, 1939. 40p. mimeographed.

Silt problems of Imperial irrigation district as affected by completion of Boulder Dam. By M. J. Dowd. Civil engineering. v.9,no.10. October, 1939. p.609-611. Construction of Boulder and



Silt. (Cont'd).

Parker dams has considerably lowered silt content of Imperial Irrigation district's water supply. As result, dredging at diversion point has been discontinued, and costly cleaning of canals and laterals has been reduced. Coincidentally, certain other problems have arisen having to do with increased seepage and increased growth of vegetation and moss. Ultimately, conditions in irrigation district will be still further altered by completion of All-American Canal and desilting works at its head. Meanwhile, however, trends are clearly discernible, and permit plans to be made for coping with incidental problems that will accompany major benefits.

Silting of reservoirs. By H. M. Eakin. Washington, D.C., 1936, rev. 1939. 168p. U.S. Department of agriculture. Technical bulletin no. 524.

Soil Stabilization.

Grouting with chemicals. By Joseph D. Lewin. Engineering news-record. v. 123, no. 7. August 17, 1939. p. 61-62. Abroad, consolidation of soils by chemicals, usually sodium silicate in combination with calcium chloride or some heavy metal salt, is practiced extensively. Early difficulties in controlling time of set have been overcome. The two chemicals are now injected simultaneously instead of separately. Chemical grouting is particularly useful in soils too fine for other types of grout to penetrate.

Soils.

Soils: an elementary treatise. By P. E. Karraker. Lexington, Ky., 1939. 63p. University of Kentucky. College of agriculture. Extension division. Circular no. 54, rev.

Snow Surveying.

Snow ridging for moisture conservation. By H. F. McColly. Agricultural engineering. v. 20, no. 10. October, 1939. p. 383-384, 386. Paper is primarily progress report on new undertaking.

Sprays and Spraying Equipment.

Dormant and delayed dormant sprays for the control of rosy apple aphids and scale insects. By W. S. Hough. Blacksburg, Va., 1939. 31p. Virginia Polytechnic institute. Agricultural experiment station. Bulletin no. 322.

Storage of Farm Produce.

Construction and management of air-cooled and cold storages with special reference to apples. By R. E. Marshall. East Lansing, Mich., 1939. 44p. Michigan state college. Agricultural experiment station. Circular bulletin no. 143, rev.



Storage of Farm Produce. (Cont'd).

Corn storage problems. By Norton Ives. Farmer. v.57,no.19.  
September 23, 1939. p.7.

Strains and Stresses.

Strength of a welded steel rigid frame. By Ambrose H. Stang and  
Martin Greenspan. U.S. National Bureau of standards. Journal  
of research. v.23,no.1. July, 1939. p.145-150.

Sugar Beets.

Economics of sugar beet production in Colorado. By R. T. Burdick.  
Fort Collins, Colo., 1939. 58p. Colorado state college.  
Colorado experiment station. Bulletin no.453.

Surveying.

From Columbus' compass to the first transit: important steps in the  
evolution of surveying instruments. By W. H. Rayner. Civil  
engineering. v.9,no.11. November, 1939. p.661-664.  
"References": p.664. Begins with close of Middle Ages, and  
traces development of modern instruments through contributions of  
such men as Digges, Lippershey, Gascoigne, Praetorius, Vernier,  
Thevenot, and Ramsden.

Tires.

Life, service and cost of service of pneumatic tractor tires. By  
E. G. McKibben and J. B. Davidson. Ames, Iowa, 1939. 186p.  
"Literature cited": p.186. Iowa state college of agriculture  
and mechanic arts. Agricultural experiment station. Agricultural  
engineering section. Bulletin no.382.

Iowa farm verdict favors rubber tires for tractors. Implement and  
tractor. v.54,no.20. September 30, 1939. p.10,21.  
Following advantages for pneumatic tractor tires: Reduced fuel  
and labor requirements; higher speeds; easier operation on hard  
surface roads; less damage to farm roads, lanes, meadows and past-  
ures; decreased tractor breakage and wear and greater comfort.  
Disadvantages experienced were higher first cost, possibility of  
delay and expense from accidental damage, expense of also equipping  
at least part of drawn equipment with rubber tires, lower maximum  
drawbar pull under many conditions, excessive bouncing under certain  
conditions, more objectionable tracks in loose tilled soil and de-  
creased stability for belt work.

Tests show rubber lessens breakage on implements. By R. E. Ritchie.  
Implement record. v.36,no.11. November, 1939. p.22.

Tobacco.

Drying and curing of bright leaf tobacco by means of conditioned air.  
By A. H. Cooper and others. Blacksburg, Va., 1939. 28p.  
Bibliography: p.28. Virginia polytechnic institute. Engin-  
eering experiment station series bulletin no.37.



Tobacco. (Cont'd).

Flue-cured tobacco farm management. By F. L. Underwood. Blacksburg, Va., 1939. 313p. Virginia polytechnic institute. Technical bulletin no.64.

Tractors.

193 of 196 owners put an o.k. on rubber-tired tractors. By J. Brownlee Davidson. Successful farming. v.37,no.9. September, 1939. p.11,22-24.

Single-wheel farm tractor has its motor inside. Popular mechanics. v.72,no.4. October, 1939. p.524.. Having only one wheel with one and one-half horsepower engine mounted at its center, lightweight tractor eases much of field work on farm. By inter-changing many small attachments, 105- pound unit is made ready to plow, cultivate, mulch, dust crops, mow or sweep lawn. It develops 3,600 revolutions per minute and hand throttle permits variable speed control.

Small tractor comes to New England. New England homestead. v.112,no.17. September 9, 1939. p.5.

Tractor drawbar capacity. By J. B. Torrance. St. Paul, Minn., 1939. 1p. University of Minnesota. Agricultural extension division. Agricultural engineering news letter no.88.

Tractor moves onto the two-horse farm. By Eugene Butler. Progressive farmer. v.54,no.10. October, 1939. p.8-9. Discusses leading makes.

Ventilation.

Ventilation for animal farm structures. By Norton Ives. St. Paul, Minn., 1939. 1p. University of Minnesota. Agricultural extension division. Agricultural engineering news letter no.90.